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10/817,539	04/02/2004	Gary L. Bush	GLB002	2517

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Jack V. Musgrove
2911 Briona Wood Lane
Cedar Park, TX 78613

EXAMINER

SUERETH, SARAH ELIZABETH

ART UNIT PAPER NUMBER

3749

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/817,539

Applicant(s)

BUSH, GARY L.

Examiner

Sarah Suereth

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) 4,5,7,19-26,30,31,33,37 and 46-53 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,6,8-18,27-29,32,34-36,38-45 and 54-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election of species dated May 23, 2006, is acknowledged. Applicant's transverse is based on the allegation that the claims are allowable. Since the allowability of the claims has not yet been determined, the species election stands. Claims 4, 5, 19-26, 30, 31, 46-53 are withdrawn from consideration, as per Applicant's statement. In addition, the Examiner further withdraws claims 7, 33 and 37 as reading on a non-elected species. Claims 1-3, 6, 8-18, 27-28, 32, 34-36, 38-45, 54-60 stand, and claims 1-3, 6, 8-18, 27-28, 32, 34-36, 38-45, 54-60 are examined.

Regarding the assertion that the claims do not imply spatial limitations, the Examiner submits that the claims and figures disclose both spatial and temporal limitations, as evidenced by the phrases "before the combustion reaction" and "in an intake" in claim 6. The phrase "inside the combustion chamber" in claim 7 is read as equivalent to -- during combustion--, and as such does not read on the elected species of treating products before combustion. Applicant is free to amend the claims to remove the ambiguity.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claims 54 is rejected under 35 U.S.C. 102(b) as being anticipated by Kita et al (5829420).

Kita discloses: several inputs (12,14) for receiving sensory data relating to the combustion reaction (col. 5, lines 51-53), control logic (10) which examines the sensory data to determine an operational adjustment factor for the nuclear resonance stimulation source (16), and an output which provides a signal indicative of the operational adjustment factor (col. 7, lines 1,2).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 54-57 and 59 are rejected under 35 U.S.C. 102(e) as being anticipated by Monette et al (6971376).

Monette discloses: an input for receiving sensory data relating to the combustion reaction (col. 5, line 29), control logic (U1) which examines the sensory data to determine an operational adjustment factor source, and an output which provides a signal indicative of the operational adjustment factor, and adjusts the frequency accordingly (col. 7, lines 38-40).

Regarding claim 55, Monette discloses a nuclear resonance stimulation source (14) emitting an electromagnetic signal having a beginning frequency (col. 2, lines

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50,51), and the controller (U1) adjusts the beginning frequency for the signal (col. 7, lines 38-40).

Regarding claim 56, the beginning frequency can be programmably set (col. 5, lines 33-35).

Regarding claim 57, Monette discloses varying the magnitude of the frequency step adjustment by using an oscillator (col. 5, lines 1-3). Various embodiments of Figure 3 show different circuit configurations, established to vary the frequency increments. These Figures read on the claimed step of "allowing a frequency adjustment value to be programmably set", because choosing the desired circuit will result in the desired frequency step.

Regarding claim 59, the controller adjusts the beginning frequency based on the temperature information (col. 5, lines 38-40).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 58 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Monette et al (6971376) in view of Kita (5829420).

Monette, as discussed above, shows an electromagnetic signal generator, having a programmable frequency. Monette does not disclose sensory data related to a gas level in the exhaust stream, or using data previously recorded to vary the frequency.

Regarding claim 58, Kita discloses an exhaust gas sensor that monitors for carbon dioxide, and the controller varies the strength of the magnetic field based on the sensor readings (col. 5, lines 1-3).

Regarding claim 60, Kita discloses adjusting the nuclear resonance stimulation source by using data previously recorded (col. 5, lines 24-26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Monette apparatus by adding the Kita carbon dioxide sensor in order to minimize carbon monoxide emissions (Kita, col. 2, lines 4,5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Monette apparatus by using previously recorded data as taught by Kita in order to easily detect a pattern of changing gas levels (Kita, col. 5, lines 23,24).

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5. Claims 1, 2, 6, 8-10, 12, 14, 15-18, 27, 28, 32, 34-36, 38, 39, and 41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (3976726) in view of Kita (5829420).

Johnson discloses: initiating a combustion reaction of a combustion material (col. 1, line 45), stimulating one or more components using nuclear resonance (col. 1, lines 28,29), to alter the oxidation of one or more components of the combustion reaction (col. 1, lines 7,8).

Johnson also discloses: a combustion chamber (col. 2, line 11), an intake (col. 2, line 21), and an exhaust port (col. 3, line 14).

Regarding claim 2, the stimulation uses nuclear magnetic resonance (col. 3, line 25).

Regarding claim 6, the stimulating is before the combustion reaction, in an intake (col. 1, lines 45,46).

Regarding claims 8 and 9, Johnson discloses emitting an electromagnetic signal (col. 2, line 45), targeting the nuclear resonance frequency of the combustion (col. 2, lines 28-30), specifically for hydrogen (col. 3, line 40) and nitrogen (col. 3, lines 65,66).

Regarding claim 10, the pulse is synchronized with the initiating of the combustion reaction (col. 1, lines 45,46).

Johnson, as discussed above, discloses the invention as claimed with the exception of adjusting the nuclear resonance stimulation based on sensed operating parameters.

Kita, as discussed above, discloses adjusting the nuclear resonance stimulation based on sensed parameters, using a feedback control loop.

6. Regarding claim 12, Kita discloses an exhaust gas sensor that monitors for carbon dioxide, and the controller varies the frequency based on the sensor readings (col. 5, lines 1-3).

Regarding claim 14, Kita discloses adjusting the nuclear resonance stimulation source by using data previously recorded (col. 5, lines 24-26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson apparatus with the Kita feed back control in order to minimize carbon monoxide emissions (Kita, col. 2, lines 4,5).

Regarding claims 15-18, and 41-45, Johnson discloses that the stimulation should be done "just before combustion" (col. 1, lines 45,46), without showing a specific time frame. Applicant discloses in the specification that the resonance relaxation time is 1 second for NMR substances and .001 seconds for NQR substances (page 5, line 8).

The courts have held when the general conditions are known in the prior art, it is not inventive to determine the optimal conditions, unless new and unexpected results occur with that range. Applicant has not demonstrated criticality for the claimed times, and has not shown how they produce different results from the prior art methods. (See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), MPEP2144.05).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson in view of Kira apparatus by ensuring the

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activation time was less than 1 second before combustion in order to use the fuel while it had the optimal amount of energy.

7. Claims 11, 13, 40, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (3976726) in view of Monette et al (6971376).

Johnson, as discussed above, discloses the claimed invention with the exception of adjusting the beginning frequency of an electromagnetic signal and using temperature conditions in the exhaust to adjust the frequency.

Monette, as discussed above, discloses that the controller adjusts the beginning frequency based on the temperature information (col. 5, lines 38-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson apparatus with the controller of Monette in order to allow the system to be easily adapted to various environments (col. 5, lines 33,34).

8. Claims 3 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (3976726) in view of Kita (5829420), and further in view of Smith .

The Johnson in view of Kita combination discloses the claimed invention with the exception of teaching a nuclear magnetic resonance source (NMR) instead of a nuclear quadruple resonance source (NQR).

Johnson discloses treating nitrogen with an NMR source (col. 3, lines 65,66).

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Smith discloses that both NQR and NMR work to chemically identify specimens, but NQR is preferred because it does not require a magnetic field (col. 2, lines 8,9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Johnson in view of Kita apparatus by replacing the NMR source with an NQR source as taught by Smith in order to use the device in an area where a magnetic field is not desired (col. 2, lines 8,9).

Conclusion

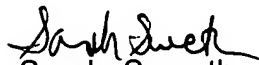
The prior art made of record on the attached form PTO-892 and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Suereth whose telephone number is (571) 272-9061. The examiner can normally be reached on Monday to Thursday 7:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on (571) 272-4828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sarah Suereth
Examiner
Art Unit 3749

Stephen Gravini for EG
STEPHEN GRAVINI
PRIMARY EXAMINER